4.10 Noise

4.10.1 Environmental Setting

NOISE TERMINOLOGY

Noise

Noise is commonly defined as unwanted sound that annoys or disturbs people and potentially causes an adverse psychological or physiological effect on human health. Because noise is an environmental pollutant that can interfere with human activities, evaluation of noise is necessary when considering the environmental impacts of a proposed project.

Sound is mechanical energy (vibration) transmitted by pressure waves over a medium such as air or water. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient (existing) sound level. Although the decibel (dB) scale, a logarithmic scale, is used to quantify sound intensity, it does not accurately describe how sound intensity is perceived by human hearing. The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called *A-weighting*, written as *dBA* and referred to as *A-weighted decibels*. Table 4.10-1 defines sound measurements and other terminology used in this chapter, and Table 4.10-2 summarizes typical A-weighted sound levels for different noise sources.

In general, human sound perception is such that a change in sound level of 1 dB cannot typically be perceived by the human ear, a change of 3 dB is barely noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level, if sound levels increase or decrease, respectively.

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (L_{eq}), the minimum and maximum sound levels (L_{min} and L_{max}), percentile-exceeded sound levels (such as L_{10}, L_{20}), the day-night sound level (L_{dn}), and the community noise equivalent level (CNEL). L_{dn} and CNEL values differ by less than 1 dB. As a matter of practice, L_{dn} and CNEL values are considered to be equivalent and are treated as such. These measurements are defined in Table 4.10-1.

For a point source such as a stationary compressor or construction equipment, sound attenuates (lessens in intensity) based on geometry at a rate of 6 dB per doubling of distance. For a line source such as free flowing traffic on a freeway, sound attenuates at a rate of 3 dB per doubling

of distance (California Department of Transportation 2013a). Atmospheric conditions including wind, temperature gradients, and humidity can change how sound propagates over distance and can affect the level of sound received at a given location. The degree to which the ground surface absorbs acoustical energy also affects sound propagation. Sound that travels over an acoustically absorptive surface such as grass attenuates at a greater rate than sound that travels over a hard surface such as pavement. The increased attenuation is typically in the range of 1–2 dB per doubling of distance. Barriers such as buildings and topography that block the line of sight between a source and receiver also increase the attenuation of sound over distance.

Table 4.10-1: Definition of Sound Measurements

Sound Measurements	*Definition*
Decibel (dB)	A unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-pascals.
A-Weighted Decibel (dBA)	An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
C-Weighted Decibel (dBC)	The sound pressure level in decibels as measured using the C-weighting filter network. The C-weighting is very close to an unweighted or *flat* response. C-weighting is only used in special cases when low-frequency noise is of particular importance. A comparison of measured A- and C-weighted level gives an indication of low frequency content.
Maximum Sound Level (L_{max})	The maximum sound level measured during the measurement period.
Minimum Sound Level (L_{min})	The minimum sound level measured during the measurement period.
Equivalent Sound Level (L_{eq})	The equivalent steady state sound level that in a stated period of time would contain the same acoustical energy.
Percentile-Exceeded Sound Level (L_{xx})	The sound level exceeded *xx* % of a specific time period. L_{10} is the sound level exceeded 10% of the time. L_{90} is the sound level exceeded 90% of the time. L_{90} is often considered to be representative of the background noise level in a given area.
Day-Night Level (L_{dn})	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
Community Noise Equivalent Level (CNEL)	The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the A-weighted sound levels occurring during the period from 7:00 p.m. to 10:00 p.m. and 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
Peak Particle Velocity (Peak Velocity or PPV)	A measurement of ground vibration defined as the maximum speed (measured in inches per second) at which a particle in the ground is moving relative to its inactive state. PPV is usually expressed in inches/second.
Frequency: Hertz (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure.

Table 4.10-2: Typical A-weighted Sound Levels

Common Outdoor Activities	*Noise Level (dBA)*	*Common Indoor Activities*
	—110—	Rock band
Jet flyover at 1,000 feet		
	—100—	
Gas lawnmower at 3 feet		
	—90—	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	—80—	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	—70—	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	—60—	
		Large business office
Quiet urban daytime	—50—	Dishwasher in next room
Quiet urban nighttime	—40—	Theater, large conference room (background)
Quiet suburban nighttime		
	—30—	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	—20—	
		Broadcast/recording studio
	—10—	
	—0—	

Note: dBA = A-weighted decibel.

Source: California Department of Transportation 2013a.

Ground Vibration

Operation of heavy construction equipment, particularly pile driving equipment and other impact devices (e.g., pavement breakers), create seismic waves that radiate along the surface of and downward into the ground. These surface waves can be felt as ground vibration. Vibration from operation of this equipment can result in effects ranging from annoyance of people to damage of structures. Variations in geology and distance result in different vibration levels containing different frequencies and displacements. In all cases, vibration amplitudes decrease with increasing distance.

Perceptible groundborne vibration is generally limited to areas within a few hundred feet of construction activities. As seismic waves travel outward from a vibration source, they cause rock and

soil particles to oscillate. The actual distance that these particles move is usually only a few ten-thousandths to a few thousandths of an inch. The rate or velocity (in inches per second) at which these particles move is the commonly accepted descriptor of the vibration amplitude, referred to as the peak particle velocity (PPV).

Vibration amplitude attenuates over distance and is a complex function of how energy is imparted into the ground and the soil or rock conditions through which the vibration is traveling. The following equation is used to estimate the vibration level at a given distance for typical soil conditions (Federal Transit Administration 2006). PPV_{ref} is the reference PPV at 25 feet (Table 4.10-3).

$$PPV = PPV_{ref} \times (25/Distance)^{1.5}$$

Table 4.10-3 summarizes typical vibration levels generated by construction equipment (Federal Transit Administration 2006) at the reference distance of 25 feet and other distances as determined using the attenuation equation above.

Table 4.10-3: Vibration Source Levels for Construction Equipment

Equipment	*PPV at 25 Feet*	*PPV at 50 Feet*	*PPV at 75 Feet*	*PPV at 100 Feet*	*PPV at 175 Feet*
Pile driver (sonic/vibratory)	0.734	0.2595	0.1413	0.0918	0.0396
Hoe ram[1] or large bulldozer	0.089	0.0315	0.0171	0.0111	0.0048
Large bulldozer	0.089	0.0315	0.0171	0.0111	0.0048
Loaded trucks	0.076	0.0269	0.0146	0.0095	0.0041
Jackhammer	0.035	0.0124	0.0067	0.0044	0.0019
Small bulldozer	0.003	0.0011	0.0006	0.0004	0.0002

Notes:

PPV = peak particle velocity.

1. Representative of rock ripper.

Source: Federal Transit Administration 2006

Tables 4.10-4 and 4.10-5 summarize guidelines developed by the California Department of Transportation (Caltrans) for damage and annoyance potential from transient and continuous vibration that is usually associated with construction activity. Equipment or activities typical of continuous vibration include: excavation equipment, static compaction equipment, tracked vehicles, traffic on a highway, vibratory pile drivers, pile-extraction equipment, and vibratory compaction equipment. Equipment or activities typical of single-impact (transient) or low-rate repeated impact vibration include: impact pile drivers, blasting, drop balls, "pogo stick" compactors, and crack-and-seat equipment (California Department of Transportation 2013b).

Table 4.10-4: Vibration Damage Potential Threshold Criteria Guidelines

	Maximum PPV (inches/second)	
Structure and Condition	*Transient Sources*	*Continuous/Frequent Intermittent Sources*
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Notes:

PPV = peak particle velocity.

1. Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: California Department of Transportation 2013b.

Table 4.10-5: Vibration Annoyance Potential Criteria Guidelines

	Maximum PPV (inches/second)	
Human Response	*Transient Sources*	*Continuous/Frequent Intermittent Sources*
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Notes:

PPV = peak particle velocity.

1. Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: California Department of Transportation 2013b.

Groundborne vibration can also be quantified by the root-mean-square (RMS) velocity amplitudes, which is useful for assessing human annoyance. The RMS amplitude is expressed in terms of the velocity level in decibel units (VdB). The background vibration velocity level in residential areas is usually around 50 VdB or lower. The vibration velocity level threshold of perception for humans is approximately 65 VdB. Most perceptible indoor vibration is caused by sources within buildings, such as the operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are heavy construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible.

Table 4.10-6 summarizes the typical groundborne vibration velocity levels and average human response to vibration that may be anticipated when a person is at rest in quiet surroundings. If the person is engaged in any type of physical activity, vibration tolerance increases considerably. The duration of the event has an effect on human response, as does its daily frequency of occurrence. Generally, as the duration and frequency of occurrence increase, the potential for adverse human response increases.

Table 4.10-6: Typical Levels of Groundborne Vibration

Human or Structural Response	*Vibration Velocity Level (VdB)*	*Typical Sources (50 feet from source)*
Threshold for minor cosmetic damage to fragile buildings	—100—	Blasting from construction project
		Bulldozer or heavy-tracked construction equipment
Difficulty in reading computer screen	—90—	
		Upper range of commuter rail
Threshold for residential annoyance for occasional events (e.g., commuter rail)	—80—	Upper range of rapid transit
Threshold for residential annoyance for frequent events (e.g., rapid transit)		Typical commuter rail Bus or truck over bump
	—70—	Typical rapid transit
Approximate threshold for human perception of vibration; limit for vibration-sensitive equipment		Typical bus or truck on public road
	—60—	
		Typical background vibration
	—50—	

Source: Federal Transit Administration 2006.

Groundborne noise is a secondary component of groundborne vibration. When a building structure vibrates, noise is radiated into the interior of the building. Typically, this is a low-frequency sound that can be perceived as a low rumble. The magnitude of the sound depends on the frequency characteristic of the vibration and the manner in which the room surfaces in the building radiate sound. Groundborne noise is quantified by the A-weighted sound level inside the building. The sound level accompanying vibration is generally 25 to 40 dBA lower than the vibration velocity level in VdB. Groundborne vibration levels of 65 VdB can result in groundborne noise levels of up to 40 dBA, which can disturb sleep. Groundborne vibration levels of 85 VdB can result in groundborne noise levels of up to 60 dBA, which can be annoying to daytime noise-sensitive land uses such as schools (Federal Transit Administration 2006).

Table 4.10-7 summarizes the criteria developed by the Federal Transit Administration (FTA) for assessing groundborne vibration from train passages. The criteria vary, depending on the frequency of events.

Table 4.10-7: Groundborne Vibration Impact Criteria

	Groundborne Vibration Impact Level (VdB)		
Land Use Category	*Frequent Events*[1]	*Occasional Events*[2]	*Infrequent Events*[3]
Category 1: Buildings where vibration would interfere with interior operations	65[4]	65[4]	65[4]
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime uses	75	78	83
Theater	72	80	N/A

Notes:

1. *Frequent Events* is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
2. *Occasional Events* is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this number of operations.
3. *Infrequent Events* is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.
4. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the heating, ventilation, and air-conditioning systems and stiffened floors.

N/A = not applicable

Source: California Department of Transportation 2013b.

PHYSICAL SETTING

This section discusses existing land uses and the existing noise conditions in the Planning Area for the proposed General Plan, which includes the BVSP Area.

Noise Sensitive Land Uses

There is a diverse profile of land uses located throughout Planning Area, including noise-sensitive land uses. Noise-sensitive land uses or sensitive receptors are those uses that are most sensitive to high noise levels. Sensitive noise receptors typically include residences, religious facilities, schools, child care centers, hospitals, long-term health care facilities, convalescent centers, and retirement homes. All of these land use types, except hospitals, occur within the Planning Area.

Existing Noise Environment

Noise Monitoring

Multi-day noise monitoring was conducted in six locations within the Planning Area. Measurement sites were dispersed across the city's geographic area to accurately represent the noise environment in the different areas of the city. Noise from major roadways influence the ambient noise levels in the Planning Area. These sources include Highway 101, El Camino Real, Ralston Avenue, Alameda de las Pulgas, SR-92, and, to a lesser extent, I-280. Continuous (24-hour) ambient noise measurements were taken between February 19 and 23, 2016. Table 4.10-8 summarizes the locations and measured L_{dn} noise levels.

Table 4.10-8: Summary of Ambient Noise Levels in the Planning Area (24-Hour Sound Level Measurements)

		L_{dn} in dBA[1]				
Number	*Location*	*2/19*	*2/20*	*2/21*	*2/22*	*2/23*
1	260 feet east of Hwy 101 median, at O'Neill Slough Trail (within Belmont Sports Complex)	73	73	73	71	72
2	60 feet west of El Camino median, at parking lot of 516 El Camino Real (700 feet south of Davey Glen Rd)	74	74	73	72	74
3	Adjacent to roadway, at 1100 Ralston Ave (200 feet east of South Rd)	71	72	70	69	71
4	Adjacent to roadway, at 611 Alameda de las Pulgas (at Arbor Ave)	67	66	66	66	67
5	Adjacent to roadway, at 1110 Alameda de las Pulgas (300 feet north of Garden Ct)	69	69	68	67	68
6	Adjacent to Ralston Avenue, between Belmont Canyon Rd and Tahoe Dr (100 feet east of Belmont Canyon Rd)	74	74	73	71	73

Notes: dBA = A-weighted decibel.

1. Noise measurements conducted in 2016.

Source: Charles M. Salter Associates, Inc.

Existing Noise Sources

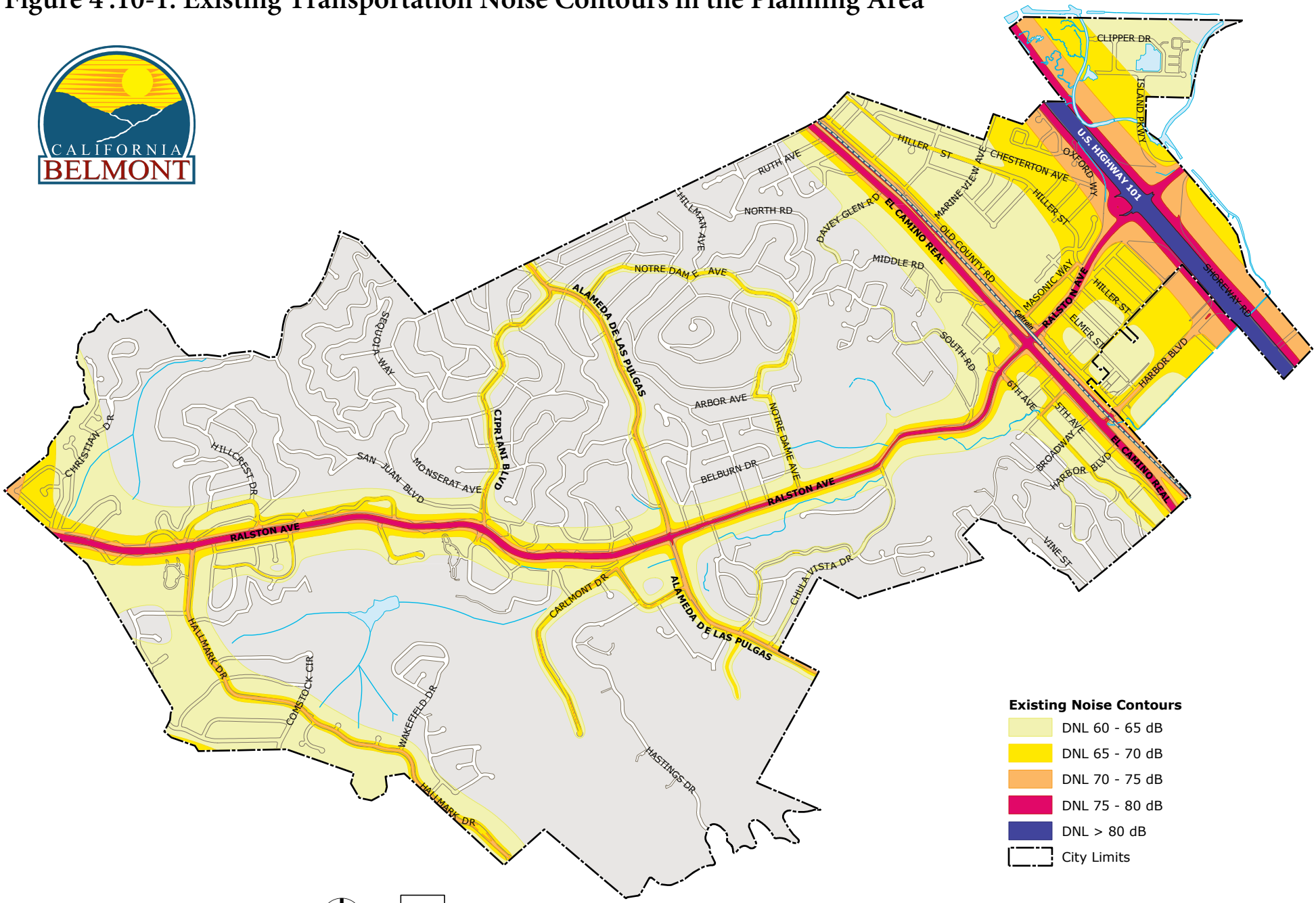
This section describes the general noise sources in the Planning Area, which include traffic, trains, aircraft overflights, and stationary sources, typical of an urban environment.

Traffic Noise

The dominant source of noise in the Planning Area and in most urban areas is noise from vehicle traffic on roadways. There are several major roadways in the Planning Area, including Highway 101, El Camino Real, Ralston Avenue, and Alameda de las Pulgas. Vehicle traffic is also the dominant source of noise along smaller roadways in the Planning Area. Existing noise contours from traffic sources in the Planning Area and the BVSP Area are shown in Figure 4.10-1 and Figure 4.10-

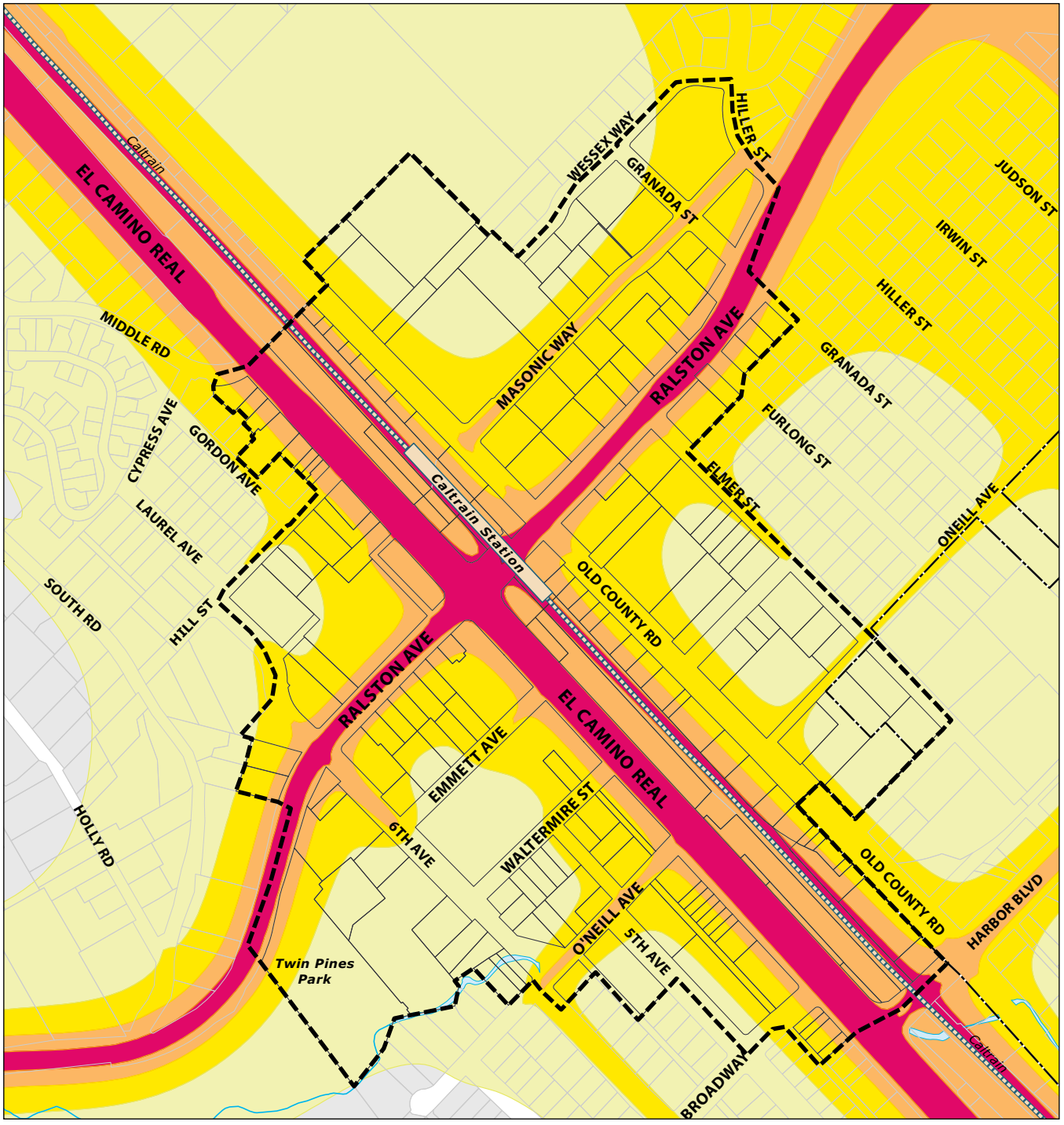
2, respectively. These figures visually represent the existing traffic-noise environment in the Planning Area and the BVSP Area, and are based on average daily traffic volumes on the major roadways.

Figure 4 .10-1: Existing Transportation Noise Contours in the Planning Area



Source: Charles M. Salter Associates, 2017; Kittelson & Associates, 2016; City of Belmont, 2016; Dyett & Bhatia, 2016.

Figure 4.10-2: Existing Transportation Noise Contours in the BVSP Area



Source: Charles M. Salter Associates, 2017; Kittelson & Associates, 2016; City of Belmont, 2016; Dyett & Bhatia, 2016

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Urban and Regional Planners

Train Noise

The diesel-powered Caltrain commuter rail line runs through Belmont, parallel to El Camino Real. Union Pacific runs diesel-powered freight trains along the rail lines during periods when Caltrain is not using the tracks, particularly in the late evening or early morning. The diesel trains generate noise; however, it is less substantial and pervasive than roadway and vehicular traffic in Belmont. In addition, noise from trains occurs intermittently and for short periods, in contrast to the virtually constant presence of automobile-generated noise. There are plans to modernize and electrify the rail line in coming years, which will provide a number of benefits for the Belmont community including reduced noise. The first electric trains may begin service in 2021 (Caltrain 2016).

Airport Overflight Noise

The greatest potential for noise intrusion from airports occurs when aircraft land, take off, or run their engines while on the ground. San Carlos Airport is located in the City of San Carlos east of Highway 101, about two miles southeast of Belmont. San Carlos Airport is owned and operated by San Mateo County, and it is designated as a reliever airport in the National Plan of Integrated Airport Systems, which means that it provides general aviation pilots and users with an alternative to congested commercial service airports like San Francisco International Airport. Noise contours developed in the 2015 Draft Airport Land Use Compatibility Plan for the airport show noise levels elevated above 60 dB CNEL extending over a small portion of southeastern Belmont along Shoreway Road. San Francisco International Airport is located about 10 miles north of Belmont, and, according to the airport's noise exposure maps, noise contours above 60 dB CNEL associated with the airport do not extend to the Planning Area.

Stationary Source Noise

Noise from stationary sources includes noise generated by residential activity and commercial and other non-residential uses. Such noise is primarily limited to noise generated by heating, ventilation, and air conditioning (HVAC), car washes, recycling yards, and other noise at commercial and industrial land uses. Many potential sources of stationary source noise exist in the Planning Area currently, and more may be developed as part of the Proposed Project.

REGULATORY SETTING

Federal, State, and local agencies regulate different aspects of environmental noise. Generally, the federal government sets noise standards for transportation-related noise sources that are closely linked to interstate commerce. These sources include aircraft, locomotives, and trucks. No federal noise standards are directly applicable to the Proposed Project. The State government sets noise standards for transportation noise sources such as automobiles, light trucks, and motorcycles. Noise sources associated with industrial, commercial, and construction activities are generally subject to local control through performance standards in municipal codes or noise ordinances and General Plan policies. Local general plans identify general principles that are intended to guide and influence development plans. State law mandates the inclusion of several key elements in a general plan, including the noise element. The noise element of the general plan typically provides land use compatibility standards for noise. The state and local noise policies and regulations that are applicable to the Proposed Project are described below.

State Regulations

California Code

Part 2, Title 24 of the California Code of Regulations "California Noise Insulation Standards" establishes minimum noise insulation standards to protect persons within new hotels, motels, dormitories, long-term care facilities, apartment houses, and dwellings other than single-family residences. Under this regulation, interior noise levels attributable to exterior noise sources cannot exceed 45 L_{dn} in any habitable room.

Local Regulations

Implementation of the Proposed Project may affect noise-sensitive uses in Belmont. The following local plans and policies related to noise apply to development within the Planning Area. Because the Proposed Project includes the adoption of new Citywide noise standards, some of these standards would change with approval of the Proposed Project. The proposed standards, and the differences between the existing and proposed standards, are discussed in Section 4.10.2, Methodology and Assumptions.

City of Belmont Noise Ordinance

Chapter 15, Article 8 of the City of Belmont's Municipal Code contains the City's Noise Ordinance, which establishes exterior noise level standards for residential and non-residential uses, interior noise level standards for multi-family residential uses, and limits on construction hours.

The current Noise Ordinance establishes a daytime exterior noise limitation of 65 dBA and a nighttime exterior noise limitation of 55 dBA for all properties (residential and non-residential). Additionally, interior noise levels transmitted through a common wall in a multi-family residential unit may not exceed 45 dBA during the daytime and 35 dBA during the nighttime. These standards are based on the target acceptable noise levels for outdoor activity levels and interior spaces set forth in the existing General Plan, which are shown in Table 4.10-9 in Section 4.10.2.

The current Noise Ordinance restricts construction activities to the hours of 8:00 a.m. and 5:00 p.m. Monday through Friday and 10:00 a.m. and 5:00 p.m. on Saturdays. Construction activities are not permitted on holidays or Sundays. Construction activities may be allowed outside of the specified hours under the following circumstances, as determined by the City's Building Official:

- Construction is necessary for emergency repairs or to protect life or property from imminent threat of harm;
- The construction site is more than 300 feet from a dwelling unit;
- Noise from the allowed construction activity is in the Building Official's opinion comparable to the noise from non-construction activity in the immediate area; or
- Expanded construction hours provide quantifiable benefit to the public and noise will not unduly interfere with the comfortable enjoyment of life or property.

Additionally, the Noise Ordinance requires all gasoline-powered construction equipment to be equipped with an operating muffler or baffling system as originally provided by the manufacturer,

and modifications to these systems are not permitted. The hourly restrictions and muffling requirements set forth in the Noise Ordinance would continue to be in place with approval of the Proposed Project.

City of Belmont General Plan

The noise element of Belmont's existing General Plan includes policies that establish compatible noise levels for various land uses, encourage non-vehicular modes of transportation to reduce traffic noise, and prohibit off-road vehicles in parks and open spaces, among other policies. The community noise exposure standards in the existing General Plan are shown in Table 4.10-9 in Section 4.10.2.

4.10.2 Impact Analysis

SIGNIFICANCE CRITERIA

Implementation of the Proposed Project would have a potentially significant adverse impact if it would:

Criterion 1: Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.

Criterion 2: Expose persons to or generate excessive groundborne vibration or groundborne noise levels.

Criterion 3: Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Criterion 4: Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Criterion 5: Be located within an airport land use plan area, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels.

Criterion 6: Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels.

Supplemental Thresholds

The criteria listed above are used to assess significance in conjunction with the specific thresholds and noise exposure standards presented in Tables 4.10-4, 4.10-5, 4.10-7, 4.10-9, 4.10-10, 4.10-11, and 4.10-12.

METHODOLOGY AND ASSUMPTIONS

As discussed in Chapter 3, Project Description, the proposed General Plan, BVSP, and Climate Action Plan (CAP) together constitute the Proposed Project analyzed in this Draft EIR. Unlike the proposed General Plan and BVSP, the CAP does not control land use development; rather, it is a policy-based comprehensive strategy for reducing the City's greenhouse gas (GHG) emissions.

Therefore, the proposed CAP creates few impacts on noise; however, where policies proposed under the CAP would impact or reduce noise levels, these effects are noted in the analysis.

Construction Noise

Because of the program-level scope of the Proposed Project, noise levels associated with Proposed Project construction activities were evaluated qualitatively for the proposed General Plan and BVSP using general construction noise levels provided by the U.S. Environmental Protection Agency (EPA) for different site categories (housing, office buildings, etc.) and construction phases (ground clearing, excavation, etc.). The general construction noise levels were assumed to be representative of the noise that could occur from the construction of reasonably foreseeable development under the Proposed Project, because the noise levels were developed by the EPA to be broadly applicable to construction activities and for "yielding at least a relative measure of the noise annoyance associated with each type of site and phase for the most adverse conditions likely to be associated with each phase". Hence, the estimates of noise levels for general construction activity from the EPA is a conservative estimate of impacts and is thus a helpful metric to analyze the Proposed Project.

Traffic Noise

Multi-day noise-level measurements were taken at six locations within the Planning Area to document existing ambient noise levels (Table 4.10-7). Peak hour A.M. and P.M. traffic volumes for intersections and freeways within and adjacent to the Planning Area (including the BVSP Area) were provided by the traffic engineer for three project conditions (existing, future with project, future no project) for conducting the traffic noise analysis. Intersection volumes were converted into roadway segment volumes by mapping out the geometries of each of the four links in each intersection. Where the links of two intersections connect (e.g. the east link of intersection 1 and the west link of intersection 2), the higher volume was assumed in order to represent a worst-case scenario and a conservative analysis.

Based on consultation with the traffic engineer, the combined peak hour segment volumes (A.M. + P.M.) were multiplied by five at each segment to estimate average daily traffic (ADT). ADT was used to more accurately calculate the L_{dn} levels associated with traffic, because the City's noise standards are in terms of L_{dn}. The ADT volumes for each roadway segment were then used with the FHWA Traffic Noise Model to calculate L_{dn} at a distance of 50 feet from the roadway centerlines. Other inputs to the FHWA model include vehicle travel speeds and the percentages of medium- and heavy-duty truck traffic on each roadway. Speeds on each segment were provided by the traffic engineer where available. Speeds on streets not provided by the traffic engineer were obtained from Google Earth imagery, or estimated based on adjacent roadways in the vicinity. Truck percentages on each non-freeway roadway segment were estimated using a standard assumption based on professional experience with estimates of truck volumes on local, non-highway roadway segments such as those in Belmont. Freeway truck volumes were assumed to be 3% based on data from Caltrans (California Department of Transportation 2015).

Train Noise

Noise from train activity is assessed qualitatively in the context of the City's noise exposure standards.

Stationary Source Noise

Because this analysis is evaluating plan-level impacts at the program level, using specific details on HVAC and other equipment is not feasible, because the layout and type of equipment is not known. Thus, stationary source impacts are discussed on a qualitative basis.

Vibration Impacts

Vibration from construction equipment was evaluated using methods recommended by Caltrans (California Department of Transportation 2013b) and the Federal Transit Administration (Federal Transit Administration 2006) using the source levels and criteria shown in Tables 4.10-3 through 4.10-7. Table 4.10-5 specifies the typical human responses in the presence of transient and continuous sources of vibration. It is difficult to determine objective criteria in the absence of limits or standards established by the County. Nevertheless, this analysis assumes that any vibration that is distinctly perceptible or stronger, based on Table 4.10-5, would be considered a significant impact, because vibration that is clearly felt in a residence or other land use that may be sensitive to vibration would likely be unwanted and/or considered an annoyance.

Aircraft Noise

To assess noise associated with aircraft in the Planning Area, two airport land use plans were used to determine the aircraft-noise contours in the vicinity of the Project. The Comprehensive Airport Land Use Compatibility Plan for the Environs of San Carlos Airport and the Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport were used for this purpose.

General Plan Noise Standards

The Proposed Project would result in an update to the community noise exposure standards in the City's existing General Plan, which are shown in Table 4.10-9. Because implementation of the Proposed Project would involve adopting new Citywide noise standards as part of the proposed General Plan, noise levels are discussed in the context of how the proposed standards differ from the standards in the existing General Plan.

If the Proposed Project is adopted, future development in the City would be subject to the standards shown in Table 4.10-10, and these criteria would be used to evaluate land use compatibility of future development. The proposed noise standards add additional land use categories and subcategories that are not included in the existing noise standards (i.e., division of residential into single family and multi-family; addition of auditoriums, concert halls, amphitheaters; and addition of golf courses, riding stables, water recreation, and cemeteries). The noise standards in the proposed General Plan would result in some overlap between the acceptable ranges of exposure (e.g., "normally acceptable" overlaps with "conditionally acceptable" for residential uses), whereas the existing General Plan acceptable ranges do not overlap. In general, the proposed noise standards would reduce or maintain the "normally acceptable" noise limits relative to the existing General Plan, with some exceptions. For institutional land uses, the proposed standards would raise the normally acceptable upper limit from 65 L_{dn} to 70 L_{dn}. However, the range for the "conditionally acceptable" limits for this use has been lowered to 60-70 L_{dn} (from 65-70 L_{dn} in the existing General Plan) to overlap with the "normally acceptable" range. For outdoor recreational areas, the proposed noise standards

would eliminate the "normally acceptable" range for these uses, which is 55-65 L_{dn} in the existing General Plan. For these uses, the conditionally acceptable range would be lowered to 55 L_{dn}.

4.10-9: City of Belmont Existing General Plan Community Noise Exposure Standards

	Common Noise Exposure, L_{dn} or CNEL, dB			
Land Use Category	*Normally Acceptable*[1]	*Conditionally Acceptable*[2]	*Normally Unacceptable*[3]	*Clearly Unacceptable*[4]
Residential – All Densities	55-65	65-70	70-80	80+
Hotels, Motels, Guest Lodging	55-65	65-75	75-80	80+
Institutions and Public Buildings (churches, schools, etc.)	55-65	65-70	70-80	80+
Playgrounds, Parks, Athletic Fields	55-70	70-75	75-80	80+
Open Space, Passive outdoor recreation	55-65	65-75	75-80	80+
Commercial – Retail, Office, Highway	55-75	75-80	80+	–
Industrial	55-75	70-80	75+	–

Notes:

1. Land use is satisfactory, Buildings can be of conventional construction, without special noise insulation requirements. Indoor and outdoor environments will be pleasant.
2. New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. Outdoor environment will seem noisy, but tolerable.
3. New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor areas must be shielded.
4. New construction or development should generally not be undertaken. Construction costs to make indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

The proposed General Plan would also establish new community noise exposure standards for transportation sources and stationary sources, shown in Tables 4.10-11 and Tables 4.10-12, respectively. The existing General Plan does not include community noise exposure standards that are specific to these sources, although such sources are subject to the general community noise exposure standards shown in Table 4.10-9.

The matrix in the proposed General Plan has been adapted from guidelines provided by the State Office of Planning and Research (Governor's Office of Planning and Research 2003). Major cities in California commonly consider maximum noise levels of 65 dB to be "normally acceptable" for unshielded residential development including outdoor space in an urban environment; suburban communities, by contrast, often prefer a 60 dB threshold. Noise levels from 65 dB to 70 dB fall

within the "conditionally acceptable" range, and those in the 70 to 75 dB range are considered "normally unacceptable." The proposed General Plan is consistent with noise control practice in urban areas, employing 60 dB as being a desirable level, but accepting 65 dB as being in the "normally acceptable" range for noise from transportation sources.

4.10-10: City of Belmont General Plan Update Community Noise Exposure Standards

		Common Noise Exposure, L_{dn} or CNEL, dB		
Land Use Category	*Normally Acceptable*[1]	*Conditionally Acceptable*[2]	*Normally Unacceptable*[3]	*Clearly Unacceptable*[4]
Residential – Low Density Single Family, Duplex, Mobile Homes	50-60	55-70	70-75	75+
Residential – Multi. Family	50-65	60-70	70-75	75+
Transient lodging – Motels, Hotels	50-65	60-70	70-80	80+
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-70	60-70	70-80	80+
Auditoriums, Concert Halls, Amphitheaters	–	50-70	65+	–
Sports Arena, Outdoor Spectator Sports	–	50-75	70+	–
Playgrounds, Neighborhood Parks	50-70	–	65-75	75+
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50-75	–	70-80	80+
Office Buildings, Businesses, Commercial and Professional	50-75	65-75	75+	–
Industrial, Manufacturing, Utilities, Agriculture	50-75	70-80	75+	–

Notes:

1. Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conversational construction, without any special noise insulation requirements.
2. New constructions or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice
3. New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
4. New construction or development should generally not be undertaken

Table 4.10-11: City of Belmont General Plan Update Proposed Noise Exposure Standards from Transportation (non-aircraft) Noise Sources

	Outdoor Activity Areas[1]	*Interior Spaces*	
Noise-Sensitive Land Use[2]	L_{dn}/CNEL, dB	L_{dn}/CNEL, dB	L_{eq}, dB
Single Family Residential	60	45	–
Multifamily Residential	65	45	–
Transient Lodging	65	45	–
Hospitals, Nursing Homes	65	45	–
Theaters, Auditoriums, Music Halls	–	–	35
Churches, Meeting Halls	65	–	45
Office Buildings	–	–	45
Schools, Libraries, Museums	–	–	45

Notes:

1. Outdoor activity areas generally include backyards of single-family residents and outdoor patios, decks, or common recreation areas of multi-family residences. Where the location of outdoor activity areas is unknown or is not applicable, the exterior noise level standard shall be applied to the property line of the receiving land use.
2. As determined for a typical worst-case hour during periods of use.

Table 4.10-12: City of Belmont General Plan Update Proposed Noise Exposure Standards from Stationary Noise Sources[1]

	Daytime[2]	*Nighttime*[3]
Hourly Equivalent Sound Level (Leq), dBA	50	45
Maximum Sound Level (Lmax), dBA	70	65

Notes:

1. Sound level measurements shall be made at a point on the receiving property nearest where the sound source at issue generates the highest sound level.
2. Daytime is the period from 8 a.m. to sunset, Monday through Friday; and from10 a.m. to sunset, Saturday, Sunday and Holidays.
3. Nighttime is the period outside the hours of "daytime" above.

City of Belmont Noise Ordinance

Following adoption of the proposed General Plan, the acceptable ranges for interior and exterior noise levels in the Noise Ordinance will be updated to be consistent with the updated General Plan, as required by State law. The Noise Ordinance will specify maximum hourly noise levels of outdoor activity areas and indoor spaces for specified land use types; measurement standards; uniform guidelines for acoustical studies based on current professional standards; and enforcement procedures.

The updated Noise Ordinance will also establish performance standards for noise reduction for new low-density residential development that may be exposed to community noise levels above 60 dBA L_{dn}, based on the target acceptable noise levels for outdoor activity levels and interior spaces in the proposed General Plan, as shown in Tables 4.10-10 and 4.10-11.

IMPACT SUMMARY

The Proposed Project would result in both short-term and long-term changes to the existing noise environment in the Planning Area. Construction noise associated with future development that would be supported by the Proposed Project could expose sensitive receptors to noise levels that exceed the noise standards set forth in both the existing and proposed General Plan. Compliance with the time-of-day restrictions and noise muffling requirements for new construction in the City's Noise Ordinance, as well as the noise-reducing policies included in the proposed General Plan and BVSP, would reduce impacts on sensitive receptors to the extent feasible. However, even with these measures, it may not be feasible in all cases to mitigate construction noise of individual projects to a less-than-significant level. Thus, impacts from construction noise would be significant and unavoidable.

Similarly, long term operational noise from traffic, trains, and stationary sources could also increase compared to existing conditions, but would be limited in area through implementation of the policies of the proposed General Plan and BVSP. Changes in traffic noise as a result of the Proposed Project would be above the General Plan noise exposure standards for single-family residential uses in some locations as compared to existing conditions. This impact would be significant and unavoidable.

Construction activity could expose people to excessive groundborne vibration. Proposed General Plan policies would require that developers mitigate any vibration impacts on sensitive land uses to the extent feasible. However, even with these measures, it may not be feasible in all cases to mitigate vibration from individual construction projects to a less-than-significant level at all sensitive receptors. Thus, impacts from construction vibration would be significant and unavoidable.

Similarly, the development of sensitive land uses in areas with substantial vibration from trains could be significant. Proposed General Plan and BVSP policies would require future development along the Caltrain tracks to incorporate mitigation to reduce vibration, which would reduce impacts. However, even with these measures, it may not be feasible in all cases to mitigate perceived vibration at all sensitive receptors. However, CEQA does not require analysis of impacts of the existing environment on a project pursuant to the California Supreme Court decision in *California Building Industry Association vs. Bay Area Air Quality Management District* (*CBIA v. BAAQMD*). Therefore, this impact would not be significant for CEQA purposes.

The Proposed Project area is not located within areas of excessive noise from either the San Carlos Airport or the San Francisco International Airport and no significant impacts are expected with respect to aircraft noise.

IMPACTS AND MITIGATION MEASURES

Impact

4.10-1 Implementation of the Proposed Project would generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies during construction. ***(Significant and Unavoidable)***

Construction Noise

Implementation of the Proposed Project would allow for increased density in the Planning Area, which would result in construction activities that would temporarily generate noise. Table 4.10-13 summarizes typical noise levels produced during key construction phases for various types of projects (U.S. Environmental Protection Agency 1971).

Table 4.10-13: Noise Levels of Key Construction Phases By Construction Type

	Sound Level at 50 Feet (dB)			
Construction Phase	*Housing*	*Industrial*	*Public Works*	*Non-Residential*
Ground clearing	85	87	88	91
Excavation	89	90	90	87
Foundations	82	89	92	87
Building/facility construction	81	85	88	88
Finishing and clean-up	86	89	90	87

Source: Based on U.S. Environmental Protection Agency 1971.

The Proposed Project would support a series of disparate construction activities associated with new development and redevelopment in the Planning Area, including the BVSP Area, which would require heavy duty machinery and equipment. Construction activities would be temporary and related noise impacts would be short-term. Each individual construction activity would generate noise that can be approximated by the noise levels for various project types shown in Table 4.10-13. At 50 feet from the source, the noise levels for all project types and phases would be above 80 dB. Because construction activities could substantially increase ambient noise levels at noise-sensitive locations, construction could result in excess noise in the vicinity of sensitive receptors that would exceed the noise standards set forth in both the existing and proposed General Plans (see Tables 4.10-9 and 4.10-11).

The potential for construction-related noise effects would depend on the proximity of construction activities to sensitive receptors, the presence of intervening barriers, the number and types of equipment used, and the duration of the activity, features that cannot be identified with accuracy in a program-level analysis. Compliance with the time-of-day restrictions and noise muffling requirements for new construction in the City's updated noise ordinance, as well as the noise-reducing policies included in the proposed General Plan and BVSP, would reduce impacts on sensitive receptors to the extent feasible. However, even with these measures, it may not be feasible in all cases to mitigate construction noise of individual projects to a less-than-significant level. While future developments may be able to achieve the necessary reduction through a com-

bination of various different mitigation strategies, it is not possible to determine with a reasonable degree of certainty that it would be feasible for all future development in the Planning Area to do so. Therefore, this impact would be significant and unavoidable.

It is noted that future development and redevelopment associated with the Proposed Project would comply with Policy 7.1-3 of the proposed General Plan and Policies 6.5-2 and 6.5-3 of the BVSP (for projects in the BVSP Area), which require that projects be built with adequate noise-reducing mitigation sufficient to meet outdoor and indoor noise exposure standards and require developers to mitigate noise exposure to sensitive receptors from construction activities to the extent feasible. Given this requirement, many users of future development would not likely be exposed to noise levels during Proposed Project construction activity that exceeds applicable noise standards. Regardless, this impact would be significant and unavoidable because of the uncertainty involved in evaluating the impact on all potential future users of new development.

Traffic Noise

The Proposed Project would allow for increased density of development that would change the land use profile in the Planning Area as compared to existing conditions. Consequently, traffic and associated traffic noise in the city would be affected. The Proposed Project would also change the noise exposure standards for land uses in the City (see Tables 4.10-9 and 4.10-11).

Peak hour (A.M. and P.M.) traffic volume data for 45 intersections and 11 freeway segments were provided by the traffic engineer and were used to develop peak hour volume data for 110 roadway segments (99 non-freeway segments and 11 freeway segments). Traffic noise modeling was conducted using the Federal Highway Administration Traffic Noise Model ("TNM").

According to the noise exposure guidelines in the existing and proposed General Plans (see Tables 4.10-9 and 4.10-11), the most stringent level of exterior noise for any land use category is the single-family residential noise limit (65 L_{dn} in the existing General Plan and 60 L_{dn} in the proposed General Plan, respectively). This analysis relies upon the single-family residential exterior noise level to present the most conservative analysis with respect to noise exposure of sensitive land uses. That is, if the Proposed Project does not result in any traffic noise impacts with respect to single family residences, it would not result in any impacts to other land uses. Because the existing General Plan noise standard (65 L_{dn}) is the operative standard at the time of this analysis, the analysis evaluates the impacts of future traffic noise levels associated with buildout of the proposed General Plan in the context of the existing General Plan noise standard. Since the proposed General Plan standard is more stringent (60 L_{dn}), an exceedance of the existing standard would also constitute an exceedance of the proposed standard. With approval of the Proposed Project, the environmental impacts from future traffic on existing uses and on new development itself would be assessed on a case-by-case basis using project-level information and the proposed community noise exposure standards for the most representative assessment of individual development impacts.

Although not all roadway segments are located within 50 feet of a noise-sensitive land use, a reference distance of 50 feet was utilized in the TNM modeling to conservatively assess potential noise impacts. Modeling indicates that there are six roadway segments that experience noise levels below 65 L_{dn} under existing conditions but would experience noise levels above 65 L_{dn} in 2035

with the Proposed Project. Additionally, there are three segments where noise levels would increase to above 70 L_{dn} in 2035 with the Proposed Project. As discussed above, the 70 L_{dn} threshold is the upper limit of the normally acceptable range in both the existing and the proposed General Plan noise exposure standards for playground and park uses.

The results of the modeling analysis is shown in Table 4.10-14. Additionally, future (2035) traffic noise levels in the Planning Area and the BVSP Area without and with implementation of the Proposed Project are visually represented in Figures 4.10-3 through 4.10-6, respectively, to provide additional context for the projected impacts of the Proposed Project in 2035; however, the conclusions with respect to the severity of the Proposed Project's impacts are based on a comparison with existing conditions in the Planning Area.

Because the Proposed Project scenario in 2035 would result in noise levels that increase to above the 65 L_{dn} and 70 L_{dn} thresholds and out of the normally acceptable range for some uses, these increases in noise result in substantial adverse effects even though most of the increased noise levels would likely be imperceptible to the human ear. Notably, half of the roadway segments that would increase to above the 65 L_{dn} threshold in 2035 with the Proposed Project (segments 5, 44, and 96) would also experience noise increases above the threshold in 2035 without the Proposed Project (i.e., under the existing General Plan conditions). At segments 86, 87, and 88, noise would increase to above 65 L_{dn} only in the 2035 scenario with the Proposed Project. However, noise would increase at these segments from 64 L_{dn} in the existing year to 66 L_{dn} in the 2035 with Project scenario, which is only 1 dB above the threshold. The total 2 dB increase (and 1 dB increase above the threshold) is not a perceptible change in noise to the human ear and is at a much higher level of precision than intended for the community noise standards, which are general guidelines. Table 4.10-15 includes the segments that would experience exceedances of the 60, 65, and 70 L_{dn} noise levels relative to existing conditions and the resulting determination of impact significance. As shown, impacts from future traffic noise would be significant and unavoidable.

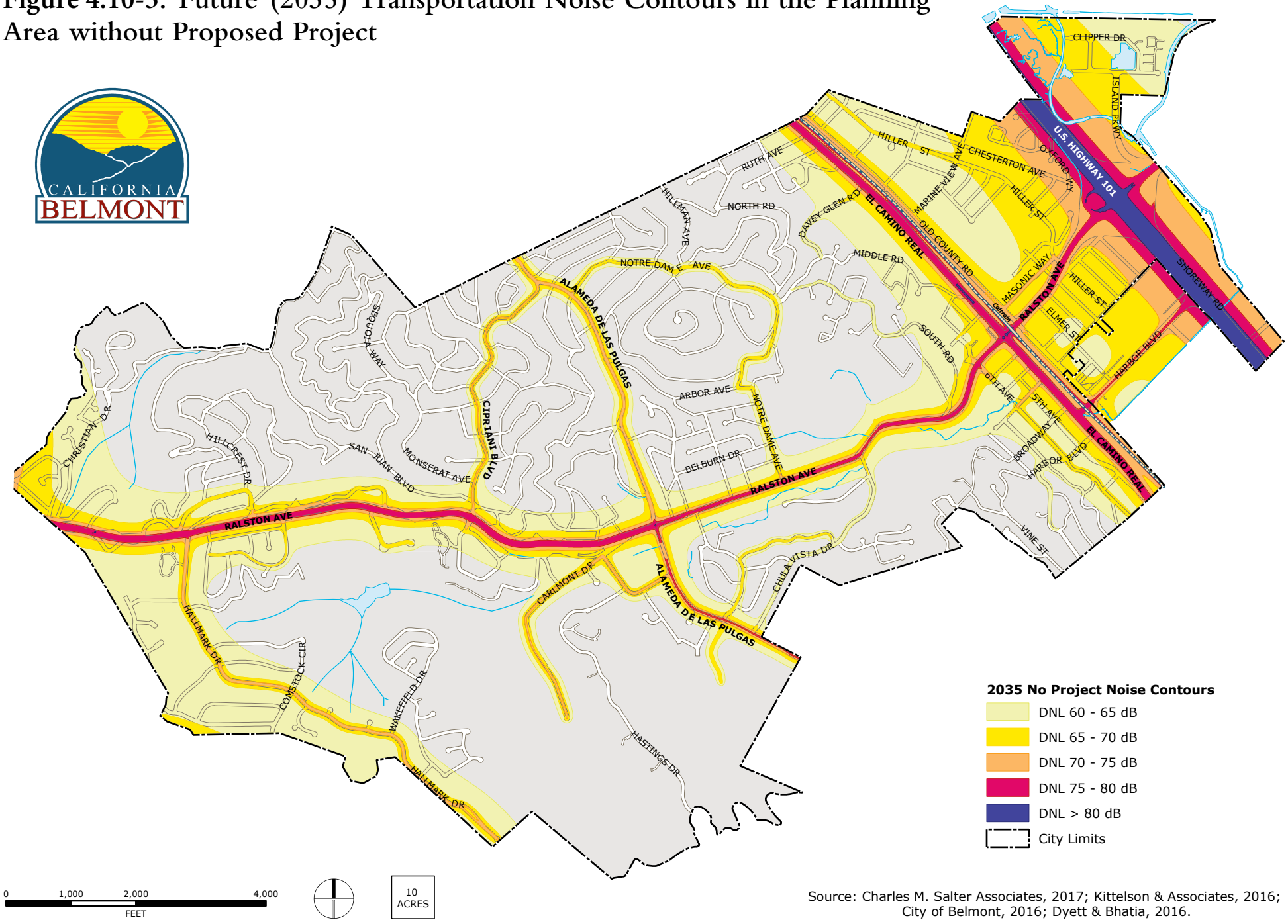
In addition to the exposure of existing sensitive land uses to potentially increased noise, the Proposed Project would allow for new sensitive land uses to be located near segments with future noise levels greater than the noise limit as specified in the proposed General Plan (see Table 4.10-11). The exceedances of the 60, 65, and 70 L_{dn} noise levels are shown in Table 4.10-15.

As summarized in Table 4.10-15, the Proposed Project could result in significant traffic noise levels at 12 roadway segments, but the project's contributions would generally be below the increase in noise that is considered to be noticeable to the human ear (3 dB). For further context, several of the exceedances of the normally acceptable range would occur in the 2035 scenario without the Proposed Project (i.e. if buildout of the Planning Area were to occur under the existing General Plan and not the proposed General Plan). However, the impacts are significant and unavoidable compared to existing conditions despite the noise reducing strategies included in the Proposed Project.

General Plan Policies 7.1-2, 7.1-3, 7.1-6, 7.1-8, and 7.2-1, BVSP Policies 6.5-1 and 6.5-2 (for development within the BVSP Area), and Measure TL2 in the CAP would protect new sensitive land uses from excessive traffic noise by requiring sufficient design features to attenuate noise and by limiting development of sensitive land uses in areas that are exposed to higher noise levels from transportation sources, and (in the case of Measure TL2) promoting the use of alternative transportation. General Plan Policy 7.3-1 would reduce the impact of traffic noise from the Proposed Project by encouraging the City to work with transportation agencies, such as Caltrans, Caltrain, and SamTrans, to mitigate transportation-related noise impacts on existing sensitive land uses. This may include encouraging installation of sound barriers or bus stop relocation in selected locations. General Plan Policy 7.1-7 would require sponsors of transportation projects to mitigate noise created by new transportation and transportation-related stationary noise sources, including roadway improvement projects, so that resulting noise levels do not exceed the City's adopted standards for noise-sensitive land uses.

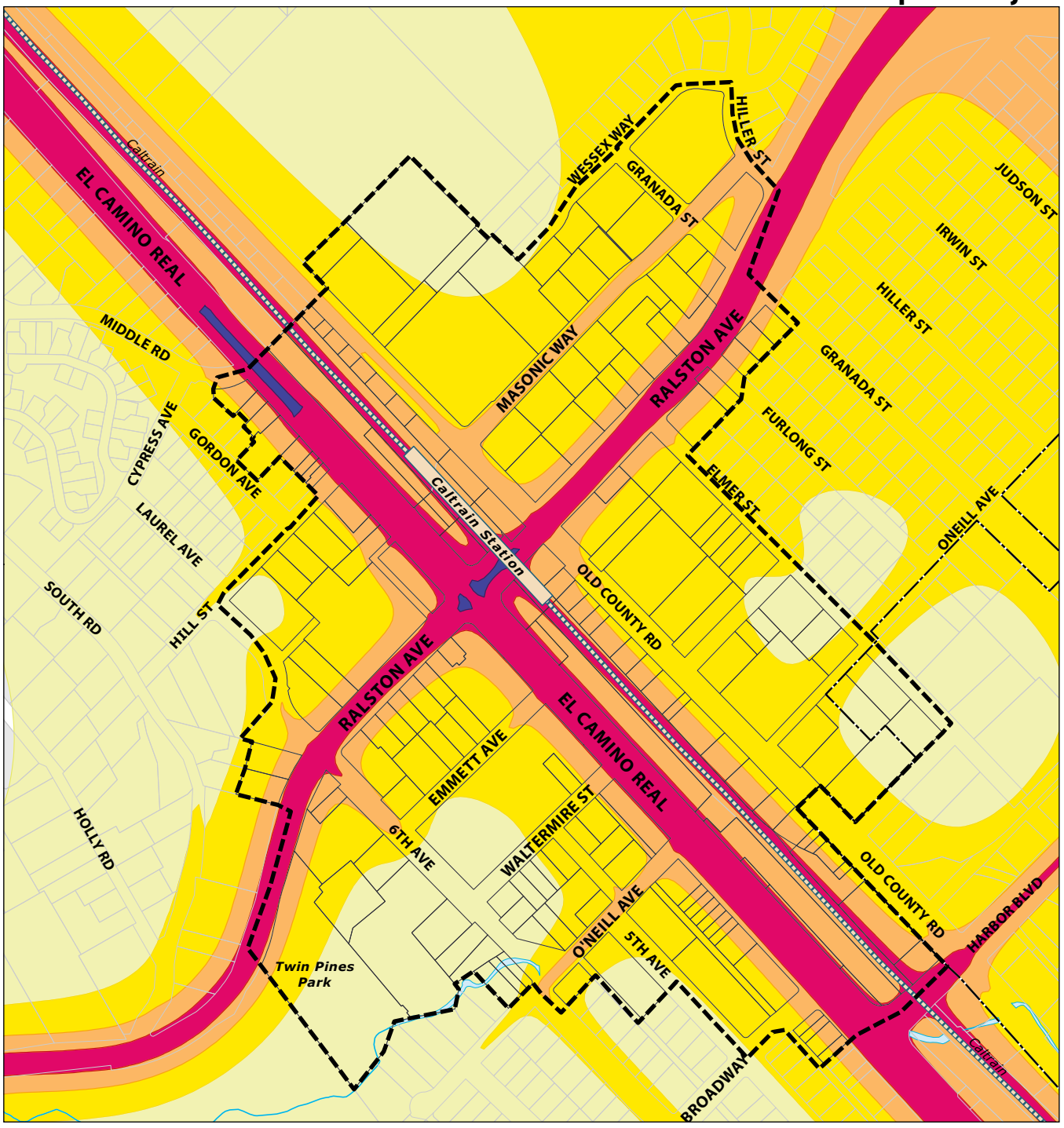
Additionally, General Plan Policy 7.3-1 could partially reduce increases in traffic noise, as discussed above. Further, as previously discussed, noise at new sensitive land uses that are part of the Proposed Project would be lessened through design. Even with the design requirements and policies to reduce the impact of noise under the Proposed Project, this impact would be significant and unavoidable.

Figure 4.10-3: Future (2035) Transportation Noise Contours in the Planning Area without Proposed Project



Source: Charles M. Salter Associates, 2017; Kittelson & Associates, 2016; City of Belmont, 2016; Dyett & Bhatia, 2016.

Figure 4.10-4: Future (2035) Transportation Noise Contours in the BVSP Area without Proposed Project



2035 No Project Noise Contours

- DNL 60 - 65 dB
- DNL 65 - 70 dB
- DNL 70 - 75 dB
- DNL 75 - 80 dB
- DNL > 80 dB

- Caltrain
- Waterway
- Study Area Parcels
- Belmont Village Planning Area
- City of Belmont

0 200 400 800
FEET

1 ACRE
0.25 ACRE

Source: Charles M. Salter Associates, 2017; Kittelson & Associates, 2016; City of Belmont, 2015; Dyett & Bhatia, 2016

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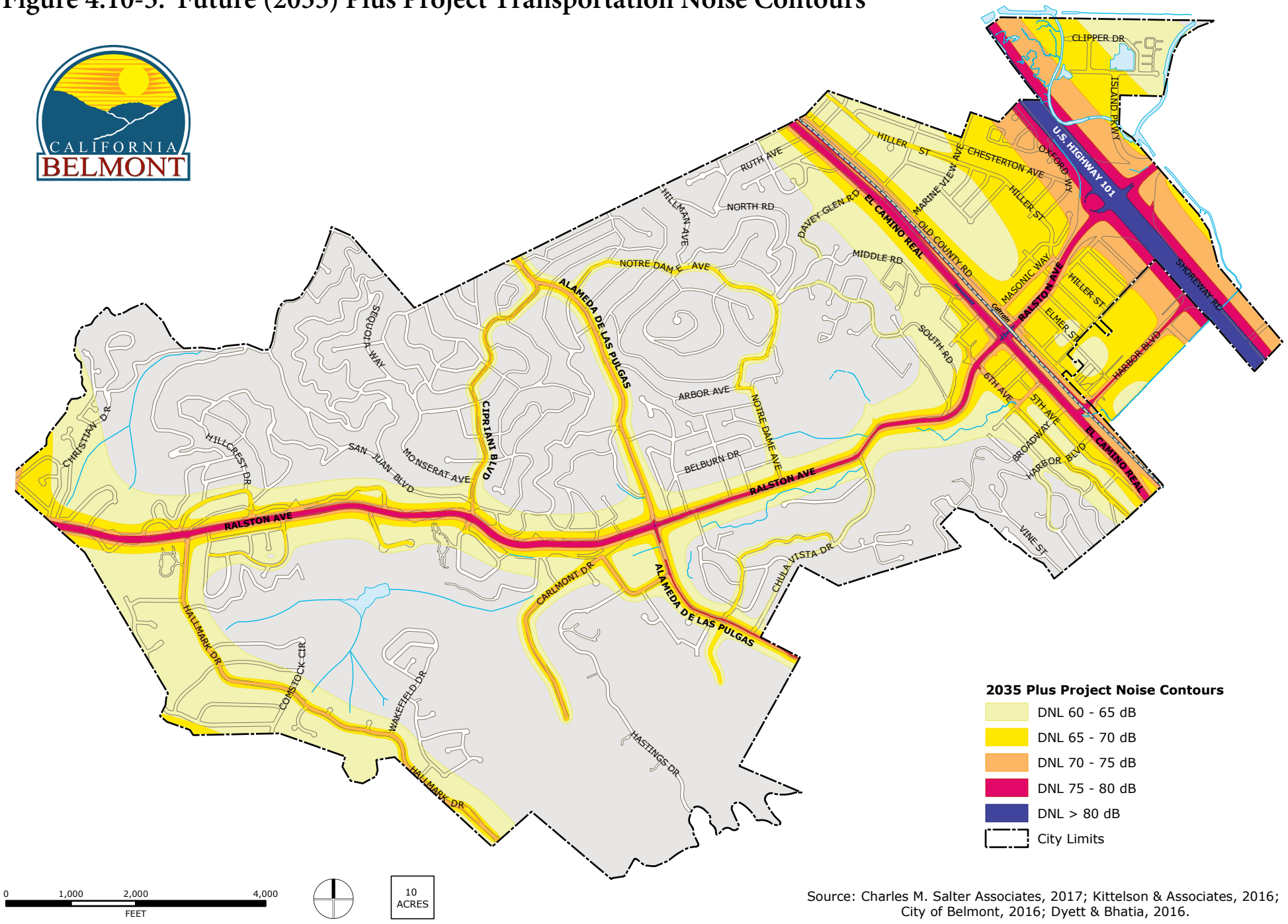
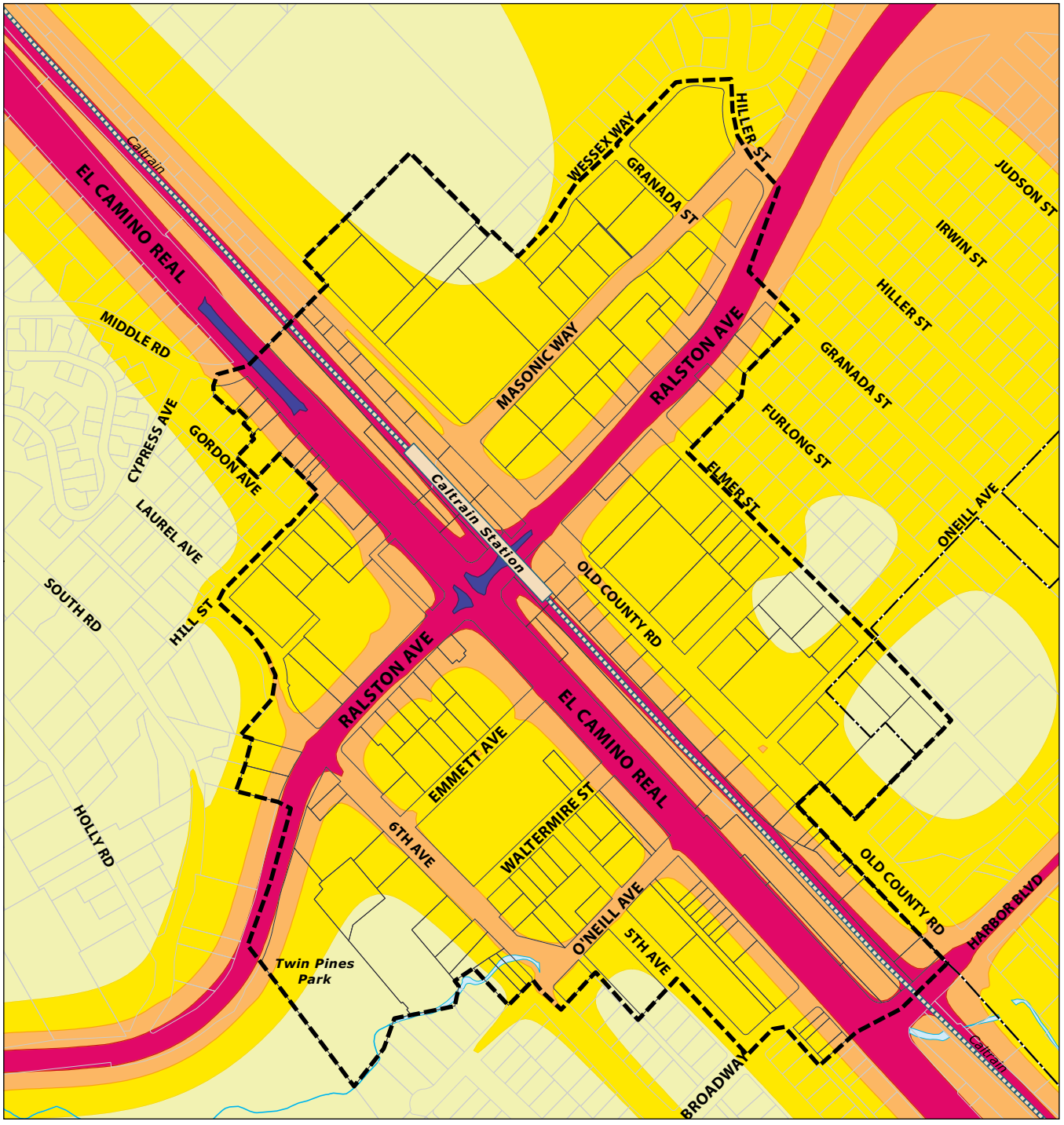
Figure 4.10-5: Future (2035) Plus Project Transportation Noise Contours



Source: Charles M. Salter Associates, 2017; Kittelson & Associates, 2016; City of Belmont, 2016; Dyett & Bhatia, 2016.

Figure 4.10-6: Future (2035) Plus Project Transportation Noise Contours in the BVSP Area



2035 Plus Project Noise Contours

- DNL 60 - 65 dB
- DNL 65 - 70 dB
- DNL 70 - 75 dB
- DNL 75 - 80 dB
- DNL > 80 dB

- Caltrain
- Waterway
- Study Area Parcels
- Belmont Village Planning Area
- City of Belmont

0 200 400 800
FEET

1 ACRE
0.25 ACRE

Source: Charles M. Salter Associates, 2017; Kittelson & Associates, 2016; City of Belmont, 2015; Dyett & Bhatia, 2016

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Table 4.10-14: Traffic Noise Modeling Results for City Roadway Segments

Roadway	*Existing L_{dn}*	*Year 2035 L_{dn} (No Project)*	*Year 2035 L_{dn} (With Project)*	*Existing to Future Delta*	*Future No Project to Future With Project Delta*
1. Alameda de las Pulgas between Carlmont and El Verano	66	68	68	2	< 1
2. Alameda de las Pulgas between Chula Vista and Cranfield	66	68	68	2	< 1
3. Alameda de las Pulgas between El Verano and Chula Vista	65	68	68	2	< 1
4. Alameda de las Pulgas between Ralston and Carlmont	67	68	68	1	< 1
5. Alameda de las Pulgas north of Ralston Ave	64	66	66	2	< 1
6. Alameda de las Pulgas south of Cranfield	66	68	68	2	< 1
7. Belmont Canyon Rd north of Ralston Ave	59	59	59	< 1	< 1
8. Caltrain Parking east of El Camino Real @ Middle Rd	36	35	36	< 1	< 1
9. Caltrain Parking east of El Camino Real @ O'Neill Ave	35	37	37	2	< 1
10. Carlmont west of Alameda de las Pulgas	62	64	64	2	< 1
11. Chula Vista Dr east of Alameda de las Pulgar	53	54	54	< 1	< 1
12. Chula Vista Dr south of Ralston Ave	55	56	56	1	< 1
13. Cipriani Blvd north of Ralston Ave	62	63	62	< 1	< 1
14. Cipriani Blvd south of Ralston Ave	61	62	61	< 1	< 1
15. Cranfield west of Alameda de las Pulgas	54	54	54	< 1	< 1
16. Davey Glen Rd west of El Camino Real	54	54	54	< 1	< 1
17. Davis Dr south of Ralston Ave	59	59	59	< 1	< 1
18. El Camino Real between Davey Glen Rd & Middle Rd-Caltrain Parking	72	73	73	1	< 1
19. El Camino Real between Emmett & Waltermire	71	73	73	1	< 1
20. El Camino Real between Flashner & Ralston	72	73	74	2	< 1
21. El Camino Real between Harbor Blvd (south) & Harbor Blvd (south)	72	73	73	1	< 1
22. El Camino Real between Hill & Flashner	72	73	74	2	< 1
23. El Camino Real between Middle Rd-Caltrain Parking & Hill	72	73	74	1	< 1

Table 4.10-14: Traffic Noise Modeling Results for City Roadway Segments

Roadway	*Existing L_{dn}*	*Year 2035 L_{dn} (No Project)*	*Year 2035 L_{dn} (With Project)*	*Existing to Future Delta*	*Future No Project to Future With Project Delta*
24. El Camino Real between O'Neill Ave & Harbor Blvd (north)	72	73	73	1	< 1
25. El Camino Real between Ralston & Emmett	71	73	73	1	< 1
26. El Camino Real between Waltermire & O'Neill Ave	71	73	73	1	< 1
27. El Camino Real north of Davey Glen Rd	72	73	73	1	< 1
28. El Verano east of Alameda de las Pulgas	57	58	58	2	< 1
29. El Verano west of Alameda de las Pulgas	59	61	61	1	< 1
30. Elmer Street between Ralston and Oneill	55	56	57	2	1
31. Emmett between fifth and El Camino	59	58	57	< 1	< 1
32. Emmett between fifth and sixth	59	58	58	< 1	< 1
33. Emmett west of sixth	59	58	53	< 1	< 1
34. Fifth Avenue between Emmett and Waltermire	57	59	55	< 1	< 1
35. Fifth Avenue between Ralston and Emmett	N/A	N/A	57	N/A	N/A
36. Fifth Avenue between Waltermire and Oneill	57	59	55	< 1	< 1
37. Fifth Avenue between Flashner and Ralston	N/A	N/A	54	N/A	N/A
38. Fifth Avenue north of Flashner	N/A	N/A	52	N/A	N/A
39. Fifth Avenue south of O'Neill	61	61	61	< 1	< 1
40. Flashner between fifth and El Camino	40	41	45	6	4
41. Flashner between fifth and sixth	N/A	N/A	52	N/A	N/A
42. Hallmark Dr south of Ralston Ave	64	65	64	< 1	< 1
43. Harbor Blvd (north) between El Camino Real & Old County Rd	67	70	70	3	< 1
44. Harbor Blvd (north) east of Old County Rd	65	67	68	3	< 1
45. Harbor Blvd South west of El Camino Real	52	53	53	2	< 1
46. Hill Street east of El Camino	33	36	36	3	< 1

Table 4.10-14: Traffic Noise Modeling Results for City Roadway Segments

Roadway	*Existing L_{dn}*	*Year 2035 L_{dn} (No Project)*	*Year 2035 L_{dn} (With Project)*	*Existing to Future Delta*	*Future No Project to Future With Project Delta*
47. Hill Street west of El Camino	53	54	54	1	< 1
48. Hiller St north of Ralston Ave	57	57	57	< 1	< 1
49. Hiller St south of Ralston Ave	48	48	48	< 1	< 1
50. Marine Pkwy east of Shoreway Rd-Oracle Pkwy	69	69	69	< 1	< 1
51. Masonic east of Old Country Road	62	63	63	1	< 1
52. Middle Rd west of El Camino Real	53	54	54	1	< 1
53. Notre Dame Ave north of Ralston Ave	60	61	60	< 1	< 1
54. Notre Dame University Rd north of Ralston Ave	52	52	53	1	1
55. Old County Rd between O'Neill and Harbor Blvd	56	58	58	2	< 1
56. Old County Rd south of Harbor Blvd	56	57	56	< 1	< 1
57. Old County Road between Masonic and Ralston	57	59	59	2	< 1
58. Old County Road between Ralston and O'Neill	56	58	59	2	< 1
59. Old County Road north of Masonic	57	59	58	1	< 1
60. Oneill Ave east of Old County Road	54	56	58	3	1
61. Oneill between fifth and El Camino	61	62	63	2	1
62. Oneill between fifth and sixth	63	63	64	1	< 1
63. Oneill west of sixth	53	55	55	2	< 1
64. Oracle Pkwy north of Marine Pkwy	63	64	64	< 1	< 1
65. Ralston Ave between Alameda de las Pulgas & Notre Dame Ave	70	71	70	< 1	< 1
66. Ralston Ave between Belmont Canyon Rd & Tahoe Dr	72	72	72	< 1	< 1
67. Ralston Ave between Chula Vista Dr & Notre Dame University Rd	71	72	71	< 1	< 1
68. Ralston Ave between Cipriani Blvd & Alameda de las Pulgas	73	73	73	< 1	< 1
69. Ralston Ave between Davis Dr & Cipriani Blvd	72	73	72	< 1	< 1

Table 4.10-14: Traffic Noise Modeling Results for City Roadway Segments

Roadway	*Existing L_{dn}*	*Year 2035 L_{dn} (No Project)*	*Year 2035 L_{dn} (With Project)*	*Existing to Future Delta*	*Future No Project to Future With Project Delta*
70. Ralston Ave between El Camino Real & Old County Rd	70	72	72	2	< 1
71. Ralston Ave between Elmer & Hiller	71	72	72	< 1	< 1
72. Ralston Ave between Hallmark Dr & Belmont Canyon Rd	72	72	72	< 1	< 1
73. Ralston Ave between Hiller Street & US 101 SB Ramps	71	71	71	< 1	< 1
74. Ralston Ave between Notre Dame Ave Chula Vista Dr	70	71	70	< 1	< 1
75. Ralston Ave between Notre Dame University Rd & South Rd	71	72	71	< 1	< 1
76. Ralston Ave between Old County Rd & Elmer St	70	71	71	1	< 1
77. Ralston Ave between Sixth Ave & El Camino Real	70	71	71	2	< 1
78. Ralston Ave between South Rd & Sixth Ave	71	72	72	< 1	< 1
79. Ralston Ave between SR 92 Eastbound Ramps & Hallmark Dr	73	74	73	< 1	< 1
80. Ralston Ave between SR 92 Westbound & Eastbound Ramps	70	71	70	< 1	< 1
81. Ralston Ave between Tahoe Dr & Davis Dr	72	73	72	< 1	< 1
82. Ralston Ave between US 101 NB Ramps-Island Pkwy & Shoreway Rd-Oracle Pkwy	71	72	72	< 1	< 1
83. Ralston Ave between US 101 SB Ramps & US 101 NB Ramps	73	73	73	< 1	< 1
84. Ralston Ave west of SR 92 Westbound Ramps	67	68	67	< 1	< 1
85. Shoreway Rd south of Marine Pkwy	62	62	62	< 1	< 1
86. Sixth Avenue between Emmett and Waltermire	64	65	66	2	< 1
87. Sixth Avenue between Ralston and Emmett	64	65	66	2	< 1
88. Sixth Avenue between Waltermire and O'Neill	64	65	66	2	< 1
89. Sixth Avenue between Flashner and Ralston	59	60	61	2	1
90. Sixth Avenue north of Flashner	59	60	61	1	< 1
91. Sixth Avenue south of O'Neill	60	61	61	1	< 1
92. South Rd north of Ralston Ave	50	51	52	3	< 1

Table 4.10-14: Traffic Noise Modeling Results for City Roadway Segments

Roadway	*Existing L_{dn}*	*Year 2035 L_{dn} (No Project)*	*Year 2035 L_{dn} (With Project)*	*Existing to Future Delta*	*Future No Project to Future With Project Delta*
93. SR 92 Eastbound Ramp north of Ralston Ave	67	68	68	< 1	< 1
94. SR 92 Westbound Ramp north of Ralston Ave	68	69	68	< 1	< 1
95. Tahoe Dr south of Ralston Ave	57	57	57	< 1	< 1
96. US 101 NB Ramp-Island Pkwuy north of Ralston Ave	65	67	67	2	< 1
97. US 101 SB Ramp north of Ralston Ave	71	71	71	< 1	< 1
98. Waltermire between fifth and El Camino	50	51	50	< 1	< 1
99. Waltermire between fifth and sixth	50	51	50	< 1	< 1
100. NB US 101 between Ralston Ave and East Hillsdale Blvd	81	83	83	2	< 1
101. SB US 101 between East Hillsdale Blvd and Ralston Ave	82	83	83	1	< 1
102. SB US 101 between Ralston Ave and Harbour Blvd	81	83	83	2	< 1
103. SB US 101 between Harbour Blvd and City Limits	82	83	83	< 1	< 1
104. NB US 101 between City Limits and Ralston Blvd	82	83	83	1	< 1
105. WB SR 92 between De Anza Blvd and Ralston Ave	78	78	78	< 1	< 1
106. EB SR 92 between Ralston Ave and De Anza Blvd	79	79	79	< 1	< 1
107. WB SR 92 between Ralston Ave and I-280	78	80	80	1	< 1
108. EB SR 92 between I-280 and Ralston Ave	79	80	80	< 1	< 1
109. SB I-280 between SR 92 and Edgewood Rd	82	82	83	< 1	< 1
110. NB I-280 between Edgewood Rd and SR 92	82	82	82	< 1	< 1

Table 4.10-15: Significant Traffic Noise Exceedances of Community Noise Standards

Segment #	*Segment*	*L_{dn} Standard Exceeded*	*Summary of Significant Impact*
5	Alameda de las Pulgas north of Ralston Ave	65	Noise would increase by only 2 dB relative to existing conditions, which is not considered noticeable to the human ear. Notably, exceedance would occur even without Proposed Project.
29	El Verano west of Alameda de las Pulgas	60	Noise would increase by only 2 dB relative to existing conditions, which is not considered noticeable to the human ear. Notably, exceedance would occur even without Proposed Project.
44	Harbor Blvd (north) east of Old County Rd	65	Noise would increase by 3 dB relative to existing conditions. Notably, exceedance would occur even without Proposed Project.
76	Ralston Ave between Old County Rd & Elmer St	70	Noise would increase by only 1 dB relative to existing conditions, which is not considered noticeable to the human ear. Notably, exceedance would occur even without Proposed Project.
77	Ralston Ave between Sixth Ave & El Camino Real	70	Noise would increase by only 1 dB relative to existing conditions, which is not considered noticeable to the human ear. Notably, exceedance would occur even without Proposed Project.
86	Sixth Avenue between Emmett and Waltermire	65	Noise would increase by only 2 dB relative to existing conditions, which is not considered noticeable to the human ear.
87	Sixth Avenue between Ralston and Emmett	65	Noise would increase by only 2 dB relative to existing conditions, which is not considered noticeable to the human ear.
88	Sixth Avenue between Waltermire and O'Neill	65	Noise would increase by only 2 dB relative to existing conditions, which is not considered noticeable to the human ear.
89	Sixth Avenue between Flashner and Ralston	60	Noise would increase by only 2 dB relative to existing conditions, which is not considered noticeable to the human ear.
90	Sixth Avenue north of Flashner	60	Noise would increase by only 2 dB relative to existing conditions, which is not considered noticeable to the human ear.
91	Sixth Avenue south of O'Neill	60	Noise would increase by only 1 dB relative to existing conditions, which is not considered noticeable to the human ear. Notably, exceedance would occur even without Proposed Project.
96	US 101 NB Ramp-Island Pkwy north of Ralston Ave	65	Noise would increase by only 2 relative to existing conditions, which is not considered noticeable to the human ear. Notably, exceedance would occur even without Proposed Project.

Train Noise

As discussed above in the Environmental Setting section, the Caltrain commuter rail line runs through the Planning Area, including the BVSP Area, parallel to El Camino Real, and Union Pacific also utilizes the tracks when not in use by Caltrain. Implementation of the Proposed Project is not expected to directly result in an increase of Caltrain operations in the Planning Area. However, new development that could occur with implementation of the Proposed Project could be exposed to train noise that exceeds the existing and proposed General Plan noise standards, including new development within the BVSP Area.

A number of policies would help to reduce noise impacts from trains that could affect new sensitive land uses within the Planning Area. General Plan Policies 7.1-2, 7.1-3, 7.1-6, 7,1-8, and 7.2-1, and BVSP Policy 6.5-2, would help to prevent the exposure of new sensitive land uses to excessive train noise by requiring adequate noise-mitigating design features, and by limiting development of sensitive land uses in areas where the City's noise standards cannot be met. Additionally, General Plan Policy 7.3-1 would direct the City to work with Caltrain to reduce potential noise effects from train operations through the use of sound barriers or other mitigating features. The California Supreme Court concluded in the *California Building Industry Association vs. Bay Area Air Quality Management District* (*CBIA v. BAAQMD*) decision that "CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents."[1] Because noise from passing trains is an existing condition in the Planning Area, and the Proposed Project would not increase train operations, this impact is not significant under CEQA. No mitigation is necessary.

Stationary Source Noise

Development under the Proposed Project would have the potential to result in increased noise levels from the development of new stationary noise sources, which could occur near sensitive land uses. Additionally, the development of new residences close to existing noise-generating land uses could also cause exposure to noise that exceeds the City's existing noise standards. Stationary sources of noise could include car washes, recycling yards, and HVAC equipment. Because this is a program-level analysis, it is not feasible at this time to determine the extent that noise sensitive land uses would be exposed to noise from equipment, because the specific layout and type of equipment is not known.

The proposed General Plan and BVSP include policies that would help reduce potential noise effects from stationary sources on new development. Proposed General Plan Policies 7.1-2, 7.1-3, 7.1-5, 7.1-6, 7.1-8, and BVSP Policy 6.5-2 would reduce the impact from stationary sources of noise, such as mechanical equipment, by requiring that new development is constructed with sufficient design measures to be consistent with the City's proposed noise exposure standards.

[1] The *CBIA v. BAAQMD* ruling provides several exceptions to the general rule regarding analysis of a project's impact on the environment: (1) if a project would exacerbate existing environmental hazards (e.g., expose hazardous waste that is currently buried), (2) if a project qualifies for certain specific exemptions (e.g., certain housing projects or transportation priority projects, per PRC 21159.21(f),(h); 21159.22(a),(b)(3); 21159.23(a)(2)(A); 21159.24(a)(1),(3); or 21155.1(a)(4),(6)), (3) if project occupants would be exposed to potential noise or safety impacts due to proximity to an airport (per PRC 21096), and (4) if the project is a school project that requires assessment of certain environmental hazards (per PRC 21151.8). None of these exceptions applies to the Proposed Project.

Proposed General Plan Policy 7.1-9 requires the City to establish noise level performance standards for new equipment and vehicles purchased by the City consistent with the best available control technology (BACT) to minimize noise and vibration. Additionally, Action 7.1-1.b of the proposed General Plan under Policy 7.1-1 calls for an update to the City's Noise Ordinance, specifically pertaining to addressing sources of excessive neighborhood noise that can cause nuisances, such as gas leaf blowers, wireless telecommunication facilities, power sources, ventilation, and cooling facilities.

With implementation of Policy 7.1-1 of the proposed General Plan, the City's Noise Ordinance would be updated to establish noise limits from sources, including stationary sources, that would affect residential areas, and to be in conformance with the proposed General Plan noise standards. Future development associated with the Proposed Project, including the BVSP, would be required to comply with the Noise Ordinance and would thus be consistent with the City's proposed noise exposure standards. Consequently, any new stationary sources of noise from the Proposed Project would be subject to the limits to be established in the Noise Ordinance, per Policy 7.1-1. These limits, according to Policy 7.1-1, will be consistent with the proposed General Plan noise standards, which are more stringent for sensitive land uses than the noise standards in the existing General Plan. Any violation of the Noise Ordinance limits would be corrected by the enforcement by any civil, administrative, or criminal remedies, per Section 15-106 of the City's Municipal Code.

Existing development would not be exposed to stationary source noise from the Proposed Project that exceeds any standards due to Policy 7.1-1. Future development would not be exposed to stationary source noise that exceeds any standards, because it would be constructed with sufficient mitigating design features. This impact would be less than significant. No mitigation measures are necessary.

Proposed General Plan Policies that Would Reduce the Impact

7.1-1 Update the City's Noise Ordinance as needed to be in conformance with the General Plan policies and noise standards.

Action 7.1-1.a Continue to limit hours for certain construction and demolition work to reduce construction-related noises.

Action 7.1-1.b Address sources of excessive neighborhood noise that can cause nuisances for residents, such as gas leaf blowers, wireless telecommunication facilities, power sources, ventilation, and cooling facilities.

7.1-2 Use the Community Noise Level Exposure Standards, shown in [General Plan] Table 7-1, as review criteria for new land uses. Require all new development that would be exposed to noise greater than the "normally acceptable" noise level range to reduce interior noise through design, sound insulation, or other measures.

7.1-3 Require noise-reducing mitigation to meet allowable outdoor and indoor noise exposure standards in [General Plan] Table 7-2. Noise mitigation measures that may be approved to achieve these noise level targets include but are not limited to the following:

- All façades must be constructed with substantial weight and insulation;

- Sound-rated windows with enhanced noise reduction for habitable rooms;
- Sound-rated doors with enhanced reduction for all exterior entries for habitable rooms;
- Minimum setbacks and exterior barriers;
- Acoustic baffling of vents is required for chimneys, attic and gable ends; and,
- Installation of a mechanical ventilation system affording comfort and fresh air under closed window conditions.

7.1-4 Alternative acoustical designs that achieve the prescribed noise level reduction may be approved, provided a qualified Acoustical Consultant submits information demonstrating that the required reductions to meet the specific targets for outdoor activity areas and interior spaces can be achieved and maintained.

7.1-5 Ensure that building regulations require that noise-generating appliances serving new multi-family or mixed-use residential development are located or adequately insulated to protect residents from the noise.

7.1-6 Promote the use of noise attenuation measures to improve the acoustic environment inside residences where existing single-family residential development is located in a noise-impacted environment, such as along an arterial street or adjacent to a noise-producing use.

7.1-7 For transportation projects subject to City approval, require that the project sponsor mitigate noise created by new transportation and transportation-related stationary noise sources, including roadway improvement projects, so that resulting noise levels do not exceed the City's adopted standards for noise-sensitive land uses.

7.1-8 Continue to enforce applicable Federal and State Noise Insulation Standards (CCR, Title 24) and noise requirements.

7.1-9 Establish noise level performance standards for new equipment and vehicles purchased by the City consistent with the best available control technology (BACT) to minimize noise and vibration.

7.2-1 Use the noise-sensitive land uses and transportation noise sources table [General Plan] (Table 7-2) and Future Noise Contours map [General Plan] (Figure 7-3) as criteria to determine acceptability of noise-sensitive land uses. Do not permit new noise-sensitive uses—including schools, hospitals, and places of worship—where noise levels are "normally unacceptable" or higher, if alternative locations are available for the uses in the city.

7.3-1 Work with Caltrans, Caltrain, SamTrans, and other agencies to mitigate transportation-related noise impacts on residential areas and sensitive uses. This may include encouraging installation of sound barriers or bus stop relocation in selected locations.

Proposed Belmont Village Specific Plan Policies that Would Reduce the Impact

6.5-1 Require residential and other noise-sensitive land uses within the 65 dB contours, as shown in [BVSP] Figure 6-6, to incorporate adequate noise attenuation into the design and site planning of the project in order to achieve an interior noise level of not more than 45 dBA. Ensure that adequate noise attenuation methods are incorporated in new development prior to the issuance of building permits.

6.5-2 Require projects in the Belmont Village Planning Area to incorporate noise mitigations to strive to achieve City standards for exterior noise levels. However, after incorporating noise mitigations, if a project still cannot achieve City standards for exterior noise levels, as determined by acoustical analysis by a licensed acoustical engineer, project sponsors may apply for an exception to City exterior noise standards.

- Such exception requests will be considered through a discretionary development entitlement process.
- Projects requesting exceptions to exterior noise standards should demonstrate that:
  - (1) all feasible noise mitigations have been incorporated to lower exterior noise levels as close as possible to City standards; and
  - (2) noise mitigations that lower interior noise levels below the City and State standard of 45 dB have been incorporated, to compensate for the high exterior noise levels which make outdoor activities uncomfortable.

6.5-3 Require developers to mitigate noise exposure to sensitive receptors from construction activities. Mitigation may include a combination of techniques that reduce noise generated at the source, increase the noise insulation at the receptor, or increase the noise attenuation as noise travels from the source to the receptor (e.g. through the incorporation of barriers).

Proposed Climate Action Plan Measures that Would Reduce the Impact

TL2 Remake urban landscape to ensure Complete Streets, with bike lanes, bike parking, traffic calming, beautification, etc. Continue to support Paper Trails and Safe Routes to School to encourage walking.

Mitigation Measures

Beyond the proposed General Plan policies and BVSP policies listed above, no mitigation measures have been identified that would be able to reduce, with a reasonable degree of certainty, construction-related noise impacts on existing sensitive receptors.

Impact

4.10-2 Implementation of the Proposed Project would generate excessive groundborne vibration or groundborne noise levels during construction. ***(Significant and Unavoidable)***

Stationary Source Vibration

As development occurs, there is generally a potential for more operational vibration sources to be developed. However, implementation of the Proposed Project would not directly result in an

increase of operational sources of vibration in the city. The vast majority of uses in the Planning Area are land use types that are not typically associated with substantial groundborne vibration (residential units, commercial space, parks, etc.). However, it is possible, that within the Planning area, vibration-generating mechanical equipment could be installed. Vibration effects from any stationary equipment would be localized to the immediate surrounding area. It would be speculative to determine the precise types and numbers of vibration-generating equipment that will be present at commercial or industrial land uses at the program level of analysis. However, as shown in Table 4.10-3, the vibration levels from heavy-duty impact construction equipment attenuates substantially within a relatively short distance. It is unlikely that any stationary equipment would interact with the ground surface as intensely as a jackhammer or the other construction equipment in 4.10-3. Nevertheless, at the relatively short distance of 50 feet, the vibration level from a jackhammer is considered to be barely perceptible (see also Table 4.10-5). Thus, even if a commercial or industrial use installs mechanical equipment that interacts with the ground as intensely as a jackhammer at the perimeter of the site property, and that equipment is within 50 feet of a sensitive land use, the vibration effect would be barely perceptible.

Given the specific and unlikely circumstances required for vibration to be more than barely perceptible to sensitive land uses, it is unlikely that there would be adverse effects from stationary source-generated groundborne vibration. Stationary source vibration impacts associated with the Proposed Project would be less than significant.

Construction Vibration

Implementation of the Proposed Project would result in construction activities that could result in temporary groundborne vibration. Construction activity can result in varying degrees of vibration, depending on the type of machinery used. Typical vibration levels are shown in Table 4.10-3 and, given the broad level of analysis required for plan-level documents, can be considered an accurate approximation for the vibration levels that would occur during any future construction activity (California Department of Transportation 2013b). Pile driving activity would likely occur in the General Plan Area east of Highway 101, because this land is composed of fill material that could potentially contain relatively tall buildings, which could require buildings constructed with the stability provided by driven piles. This would be most likely to occur in areas zoned Regional Commercial, a new zoning district under the Phase I Zoning that allows for building heights of up to 55 feet. Pile driving is not as likely to occur in other portions of the Planning Area. Construction activities, including pile driving, associated with new development would be temporary, and the corresponding vibrational impacts would be relatively short-term.

Nevertheless, heavy duty equipment associated with some construction activities can produce vibration that may be felt by adjacent uses. The main concern associated with this type of vibration is annoyance; however, vibration-sensitive instruments and operations can be disrupted at much lower levels than would typically affect other uses. In extreme cases, vibration can cause damage to buildings, particularly those that are old or otherwise fragile. Activities such as pile-driving, blasting, drilling, and excavation have the highest potential for creating groundborne vibration impacts. The potential construction-related vibration impacts depend on the proximity of construction activities to sensitive receptors, the presence of intervening barriers, the number and types of construction equipment, and duration of construction equipment use. In general,

perceptible groundborne vibration is limited to areas within a few hundred feet of construction activities.

Future and existing development adjacent to construction sites could be exposed to excessive groundborne vibration temporarily (i.e. vibration that is distinctly perceptible or stronger, based on Table 4.10-5). To protect future and existing sensitive land uses from excessive groundborne vibration during construction activities, proposed General Plan Policy 7.1-10 requires developers constructing new development in the Planning Area, including the BVSP Area, to implement mitigation practices to reduce vibration, such as operating heavy equipment as far as practical from residential uses; using smaller bulldozers (operating weight less than 20,000 pounds) when grading must occur within approximately 50 feet of residential uses or other vibration sensitive uses; and using quiet pile driving technology when feasible. However, even with these measures, it may not be feasible in all cases to mitigate construction vibration from individual projects to a less-than-significant level. While future developments may be able to achieve the necessary reduction through a combination of various different mitigation strategies, it is not possible to determine with a reasonable degree of certainty that it would be feasible for all future development in the Planning Area to do so. Therefore, this impact would be significant and unavoidable.

Traffic Vibration

Groundborne vibration generated by traffic traveling on roadways is usually below the threshold of perception at adjacent land uses, unless there are severe discontinuities in the roadway surface. Discontinuities in the roadway include segments where the pavement has settled or cracked. Caltrans has determined that only heavy trucks typically result in appreciable ground vibration when they travel over discontinuities in the roadway, and the vibration that results has a duration of only a fraction of second (California Department of Transportation 2013b). This analysis assumes that roadways in the Planning Area do not have substantial settling or cracking and will be reasonably maintained with no severe discontinuities. Additionally, truck traffic on the roadways in Belmont is estimated to be a maximum of only 3 percent of total vehicle volumes. Given the specific set of circumstances required for traffic vibration to be noticeable (severe roadway discontinuities and high truck volumes) and the duration of the impact that would result under these circumstances (a fraction of a second), it is unlikely that traffic vibration would be perceived by any land uses. Therefore, no analysis of vibration generated by operational traffic is provided, as it would be too speculative to accurately identify any impacts.

Train Vibration

Typical locomotive-powered passenger or freight trains traveling at 50 mph will produce a vibration level of about 85 VdB at a distance of 50 feet, based on the vibration curves shown in Figure 10-1 of the Federal Transit Administration's guidance document *Transit Noise and Vibration Manual Impact Assessment* (Federal Transit Administration 2006). The vibration level at 50 feet produced by a light rail train traveling at the same speed is about 73 VdB. (Federal Transit Administration 2006: Figure 10-1). Caltrain has a maximum speed of 79 mph and thus likely travels at speeds of 50 mph or greater through Belmont (Caltrain n.d.). This indicates that noise- and vibration-sensitive land uses located adjacent or close to railroad tracks could be exposed to vibration levels in excess of FTA vibration standards shown in Table 4.10-7. The Proposed Project would introduce land use designations that would allow for residential uses directly adjacent to

the Caltrain tracks both within and outside (north and south of) the BVSP Area. Proposed General Plan Policy 7.1-11 and BVSP Policy 6.5-4 call for new development to include mitigation measures to mitigate groundborne vibration associated with the Caltrain tracks, which would reduce vibration impacts to the extent feasible. However, even with these measures, it may not be feasible in all cases to mitigate vibration impacts on all projects to a level below FTA vibration standards. The California Supreme Court concluded in the *California Building Industry Association vs. Bay Area Air Quality Management District* (*CBIA v. BAAQMD*) decision that "CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents." Because vibration from passing trains is an existing condition in the Planning Area, and the Proposed Project would not increase train operations, this impact is not significant under CEQA.

Proposed General Plan Policies that Would Reduce the Impact

7.1-10 Require developers of new development anticipated to generate a substantial amount of vibration during construction to implement mitigation practices to reduce vibration, which can include: operating heavy equipment as far as practical from residential uses; using smaller bulldozers (operating weight less than 20,000 pounds) when grading must occur within approximately 50 feet of residential uses or other vibration sensitive uses; and using quiet pile driving technology when feasible.

7.1-11 Require development projects to include mitigation measures to protect the development from ground borne vibration from the railway if located within 120 feet of the centerline of Caltrain rail tracks.

Proposed Belmont Village Specific Plan Policies that Would Reduce the Impact

6.5-4 Require development projects to include mitigation measures to protect the development from ground borne vibration from the railway if located within 120 feet of the centerline of Caltrain rail tracks.

Proposed Climate Action Plan Measures that Would Reduce the Impact

There are no policies in the Climate Action Plan that would reduce this impact.

Mitigation Measures

Beyond the proposed General Plan policies and BVSP policy listed above, which are components of the Proposed Project, no mitigation measures have been identified that would be able to reduce, with a reasonable degree of certainty, vibration impacts on existing sensitive receptors from construction activities.

Impact

4.10-3 Implementation of the Proposed Project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. ***(Less than significant)***

Traffic noise levels throughout the Planning Area would change with development occurring under the Proposed Project, and noise levels along some roadways would be expected to increase.

While the analysis under Impact 4.2-1 addresses the potential for this increase to exceed community noise exposure standards, this analysis addresses the perceived effect to sensitive receptors and whether that change would be substantial. Compared to existing conditions, traffic noise increases from the Proposed Project would be less than 3 dB for all roadways except for six segments, as reflected in the traffic noise modeling results in Table 4.10-14. As discussed in the Physical Setting section, a 3 dB change in noise is barely noticeable to the human ear. Thus, the Proposed Project would not result in a permanent substantial increase in traffic noise at almost all roadway segments. At four segments (43, 44, 46, and 60), traffic noise would increase in 2035 with the Proposed Project by 3 dB relative to existing conditions, which would be at the threshold of perceptibility and is not considered a substantial permanent increase. Notably, as shown in Table 4.10-14, the difference in noise at these segments between the 2035 with Project and without Project scenarios would be 1 dB or less. This indicates that the increases in noise are primarily the result of factors not associated with the Project, because the increase would occur in the absence of the Project (i.e., under buildout of the existing General Plan). At segment 40, noise would increase by 6 dB relative to existing conditions and 4 dB relative to conditions in 2035 without the Project. Although this increase may be perceptible, there are no sensitive land uses within 50 feet of this roadway that would experience the increase. Additionally, because the noise level at this roadway in 2035 with the Project is still expected to be extremely quiet for an urban area (45 L_{dn} as shown in Table 4.10-14) and below the proposed normally acceptable noise range for the most sensitive land uses under the Proposed Project (50 L_{dn}), no adverse effects are expected.

Stationary source noise, as discussed under Impact 4.2-1, is not anticipated to substantially increase as a result of the Proposed Project, because any such noise would be reduced by proposed General Plan Policy 7.1-1. The Proposed Project is not anticipated to increase noise from any other types of permanent noise sources. Because the Proposed Project would not result in a substantial permanent increase in ambient noise levels, this impact would be less than significant.

Proposed General Plan Policies that Would Reduce the Impact

Refer to policies identified under Impact 4.10-1.

Proposed Belmont Village Specific Plan Policies that Would Reduce the Impact

Refer to policies identified under Impact 4.10-1.

Proposed Climate Action Plan Measures that Would Reduce the Impact

Refer to policies identified under Impact 4.10-1.

Mitigation Measures

No mitigation is necessary.

Impact

4.10-4 Implementation of the Proposed Project would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. (*Significant and Unavoidable*)

Development of the Proposed Project could result in a substantial temporary increase in ambient noise levels in the Planning Area due to increased construction activities, as discussed for Impact 4.2-1. The Proposed Project is not anticipated to result in other sources of temporary noise than construction. Compliance with the time-of-day restrictions and noise muffling requirements for new construction in the City's Noise Ordinance, as well as the noise-reducing policies included in the proposed General Plan and BVSP, would reduce impacts on sensitive receptors to the extent feasible. However, even with these measures, it may not be feasible in all cases to mitigate construction noise of individual projects to a less-than-significant level (i.e., below the City's proposed noise standards). While future developments may be able to achieve the necessary reduction through a combination of various different mitigation strategies, it is not possible to determine with a reasonable degree of certainty that it would be feasible for all future development in the Planning Area to do so. Therefore, this impact would be significant and unavoidable.

Proposed General Plan Policies that Would Reduce the Impact

Refer to policies identified under Impact 4.10-1.

Proposed Belmont Village Specific Plan Policies that Would Reduce the Impact

Refer to policies identified under Impact 4.10-1.

Proposed Climate Action Plan Measures that Would Reduce the Impact

There are no policies in the Climate Action Plan that would reduce this impact.

Mitigation Measures

Beyond the proposed General Plan and BVSP policies listed above, which are components of the Proposed Project, no mitigation measures have been identified that would be able to reduce, with a reasonable degree of certainty, noise impacts on existing sensitive receptors from construction activities.

Impact

4.10-5 Implementation of the Proposed Project would not expose people residing or working in the Planning Area to excessive noise levels associated with airports. *(Less than significant)*

As discussed in the environmental setting, the Planning Area is located in the general vicinity of two existing and operational airports: San Carlos Airport (approximately 2 miles southeast of Belmont Village) and San Francisco International Airport (approximately 10 miles north of Belmont Village). The greatest potential for noise intrusion from airports occurs when aircraft land, take off, or run their engines while on the ground. Areas that are most affected by airport noise are typically defined by noise contours in an airport land use plan. Thus, determining where a project is located with respect to an airport's noise contours is a useful approach to assessing whether the project would be affected by airport noise. Generally, CEQA does not require analysis of impacts of the existing environment on a project (*see CBIA v. BAAQMD*). However, projects situated within an airport land use compatibility plan boundary must use the Airport Land Use Planning Handbook

published by the Division of Aeronautics of the Department of Transportation as a technical resource with respect to noise problems.[2] Because a portion of the planning area is located within an airport land use compatibility boundary, the following analysis of airport-related noise on the Proposed Project is warranted.

As illustrated in Exhibit 4-1 of the land use plan for San Carlos airport, the Planning Area is not located within the lowest established noise contour associated with the airport in 2013 (60 CNEL) (refer to Appendix D for the 2013 map of aircraft noise contours). As shown in Exhibit 4-2, a small portion of the Planning Area is located in close proximity to the 60 CNEL contour line associated with future operation of the airport in 2035 (refer to Appendix D for the 2035 map of aircraft noise contours) (City/County Association of Governments of San Mateo County 2015). Based on the community noise exposure limits established in the proposed General Plan Noise Element, airport noise of 60 CNEL would not conflict with any potential future land use associated with the Proposed Project. Thus, it is unlikely that any people associated with development or redevelopment of the Proposed Project would be exposed to excessive noise levels from the San Carlos Airport.

With respect to the San Francisco International Airport, no parts of the Planning Area are located within the forecasted 65 CNEL contour line in 2020 predicted in the Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport. The Planning Area is located over 3.5 miles from the 65 CNEL contour line, so it is unlikely that any people associated with development or redevelopment of the Proposed Project would be exposed to excessive noise levels from San Francisco International Airport for any substantial amount of time.

Thus, people residing and working in the Planning Area, including the BVSP Area, would not be exposed to excessive levels of noise from aircraft overflight. This impact is less than significant, and no mitigation is necessary.

Proposed General Plan Policies that Would Reduce the Impact

7.3-2 Continue to work with the San Carlos Airport in improving and implementing its noise abatement program.

Proposed Belmont Village Specific Plan Policies that Would Reduce the Impact

There are no policies in the Belmont Village Specific Plan that would reduce this impact.

Proposed Climate Action Plan Measures that Would Reduce the Impact

There are no policies in the Climate Action Plan that would reduce this impact.

Mitigation Measures

No mitigation is necessary.

[2] Pub. Res. Code § 21096(a).

Impact

4.10-6 Implementation of the Proposed Project would not expose people residing or working in the Planning Area to excessive noise levels associated with private airstrips. ***(No impact)***

No private airfields are located in the Planning Area. Residents and employees within these areas would not be exposed to adverse levels of noise from aircraft overflights associated with private airfields. No impact would occur, and no mitigation would be necessary.

Proposed General Plan Policies that Would Reduce the Impact

No impact would occur.

Proposed Belmont Village Specific Plan Policies that Would Reduce the Impact

No impact would occur.

Proposed Climate Action Plan Measures that Would Reduce the Impact

No impact would occur.

Mitigation Measures

No mitigation is necessary.